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EVERBOUQUET INTERNATIONAL CO., LTD.

AVAILABLE FROM MIDAS COMPONENTS LTD

PART NO. : MG24065G SERIES

FOR MESSRS. :

CONTENTS

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ACCEPTED BY: ---------------- PROPOSED BY : ----------------

RECORD OF REVISION

DATE	PAGE	SUMMARY
2003/8/12	P8	ADD THE 21TH & 22TH MOUNTING HOLES OF I/O
	P9	ADD THE 21TH & 22TH PIN DEFINITION OF INTERFACE
2003/9/18	P4	MODIFY THE MECHANICAL DATA: (3)EFFECTIVE AREA: 132.6W*39.0H→134.0W*40.0H

3. General specifications

3.1 General specifications

PLEASE REFER TO:

"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-6963C)".

3.2 This individual specification is prior to general specifications

3.3 NUMBERING SYSTEM

MG24065G	-	S	G	L	W	U
		(1)	(2)	(3)	(4)	(5)

(1).LCD TYPE :

"S" : STN TYPE

"F" : FSTN TYPE

(2).LCD COLOR :

"Y" : YELLOW-GREEN

"G" : GRAY

"B" : BLUE(STN/ NEGATIVE) / BLACK(FSTN/ NEGATIVE)

"W" : WHITE(FSTN/ POSITIVE)

(3).BACKLIGHT TYPE :

"E" : EL BACKLIGHT

"L" : LED BACKLIGHT

"R" : REFLECTIVE

(4).BACKLIGHT COLOR :

LED TYPE :

"nil" : YELLOW-GREEN	"A" : AMBER	"B" : BLUE
"G" : GREEN	"O" : ORANGE	"R" : RED
"W" : WHITE		

(5).VIEWING ANGLE :

"nil" : 6 O'CLOCK

"U" : 12 O'CLOCK

4. Mechanical data

(1) NUMBER OF DOT--------------------------- 240 W* 64 H DOTS

(2) MODULE SIZE ------------------------------- 180.0 W * 65.0 H * C T (Max) mm

(The value of “C” refer to Outline Dimension P8/11)

(3) EFFECTIVE AREA ------------------------- 134.0 W * 40.0 H mm ⚠2

(4) ACTIVE AREA ------------------------------ 127.16 W * 33.88 H mm

(5) DOT SIZE------------------------------------- 0.49 W * 0.49 H mm

(6) DOT PITCH --------------------------------- 0.53 W * 0.53 H mm

5. Absolute maximum ratings

5.1 Electrical absolute maximum ratings

I T E M	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	V_{DD}-V_{SS}	0	6.0	V	-------
INPUT VOLTAGE	V_I	V_{SS}	V_{DD}	V	-------
STATIC ELECTRICITY	-------	-------	100	V	NOTE (1)
POWER SUPPLY FOR EL BACKLIGHT	V_{EL}	------	AC200	Vrms	f_{EL}=1.0KHz 60 SEC.MAX
	f_{EL}	------	2.0	KHz	AC115 Vrms 60 SEC.MAX
POWER SUPPLY FOR LED	V_{LED}	------	6.0	V	------

NOTE (1): ELECTRO-STATIC DISCHARGE RESISTANCE IS TESTED BY CHARGING A 200PF CAPACITOR AND DISCHARGING IT BY CONTACT WITH A INTERFACE CONNECTOR PIN.

5.2 Environmental absolute maximum ratings

I T E M	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-20℃	70℃	-20℃	70℃	------
HUMIDITY	NOTE (2)		NOTE (2)		NO CONDENSATION
VIBRATION NOTE (3)	------	0.5G	------	2G	10 300HZ XYZ DIRECTIONS 1 Hr EACH
SHOCK NOTE (3)	------	3G	------	50G	10 msec XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		------

NOTE (2): Ta ≦ 50℃: 90% RH MAX.

Ta ＞ 50℃: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90% RH AT 50℃. (80%RH AT 60℃)

NOTE (3): 1G = 9.8 m/s^2

6. *Electrical characteristics*

Ta = 25 ℃ V_{DD} = 5.0 ±0.25 V

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR CIRCUIT	V_{DD}-V_{SS}	---------------	4.75	5.0	5.25	V
INPUT VOLTAGE NOTE (1)	V_{IH}	H LEVEL	2.0	-------	V_{DD}	V
	V_{IL}	L LEVEL	0	-------	0.8	V
OUTPUT VOLTAGE NOTE (2)	V_{OH}	I_{OH} = -0.3 mA	2.4	-------	-------	V
	V_{OL}	I_{OH} = 3.0 mA	-------	-------	0.4	V
POWER SUPPLY CURRENT, NOTE (3)	I_{DD}	V_{DD}-V_{SS} = 5.0 V	-------	20.0	30.0	mA
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(4)	V_{DD}-V_{O}	STN/ FSTN DUTY =1/64 Φ=10° NOTE(5), Ta=-20°C	------	13.1	------	V
		Ta= 0°C	------	12.9	------	V
		Ta= 25°C	------	12.7	------	V
		Ta= 50°C	------	12.5	------	V
		Ta= 70°C	------	12.4	------	V
POWER SUPPLY CURRENT FOR EL BACKLIGHT	I_{EL}	V_{EL} = 115Vrms, f_{EL} = 400Hz	------	8.0	------	mArms
POWER SUPPLY CURRENT FOR LED	I_{LED}	---------------	-------	NOTE(6)	NOTE(6)	mA

NOTE (1): APPLIED TO TERMINALS DBO ~ DB7,$\overline{WR}$,$\overline{RD}$,CS,C/$\overline{D}$,$\overline{RES}$.FS

(2): APPLIED TP TERMINALS DBO ~ DB7

(3): THE DISPLAY PATTERN IS ALL “ON”, OR ALL “OFF”

(4): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ±0.5V BY EACH MODULE.

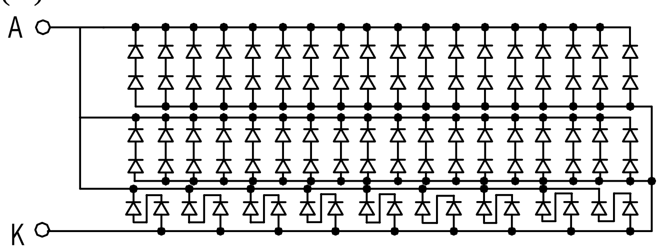
(5): θ = 0° : VIEWING ANGLE AT 6 O’CLOCK

θ = 180° : VIEWING ANGLE AT 12 O’CLOCK

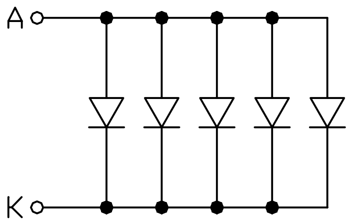
(6): LED CURRENT OF DEFFERENT LED TYPE

TYPE	V_{LED}	I_{LED} TYP. / MAX.	LED TYPE
A	5.0V	450mA / 700mA	YELLOW-GREEN ,ORANGE (ARRAY LED)
B	4.0V	75mA / 100mA	WHITE (EDGE LED)

(A)



(B)



7. *Optical characteristics*

STN TYPE LCD

Ta = 25℃ V_{DD}-V_O =12.7V

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 10° NOTE(1)	3.0	4.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 10° NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	Φ = 10° NOTE(1)	----	300	400	ms	NOTE(2)

FSTN TYPE LCD

Ta = 25℃ V_{DD}-V_O =12.7V

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 10° NOTE(1)	4.0	5.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 10° NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	Φ = 10° NOTE(1)	----	300	400	ms	NOTE(2)

Brightness for backlight

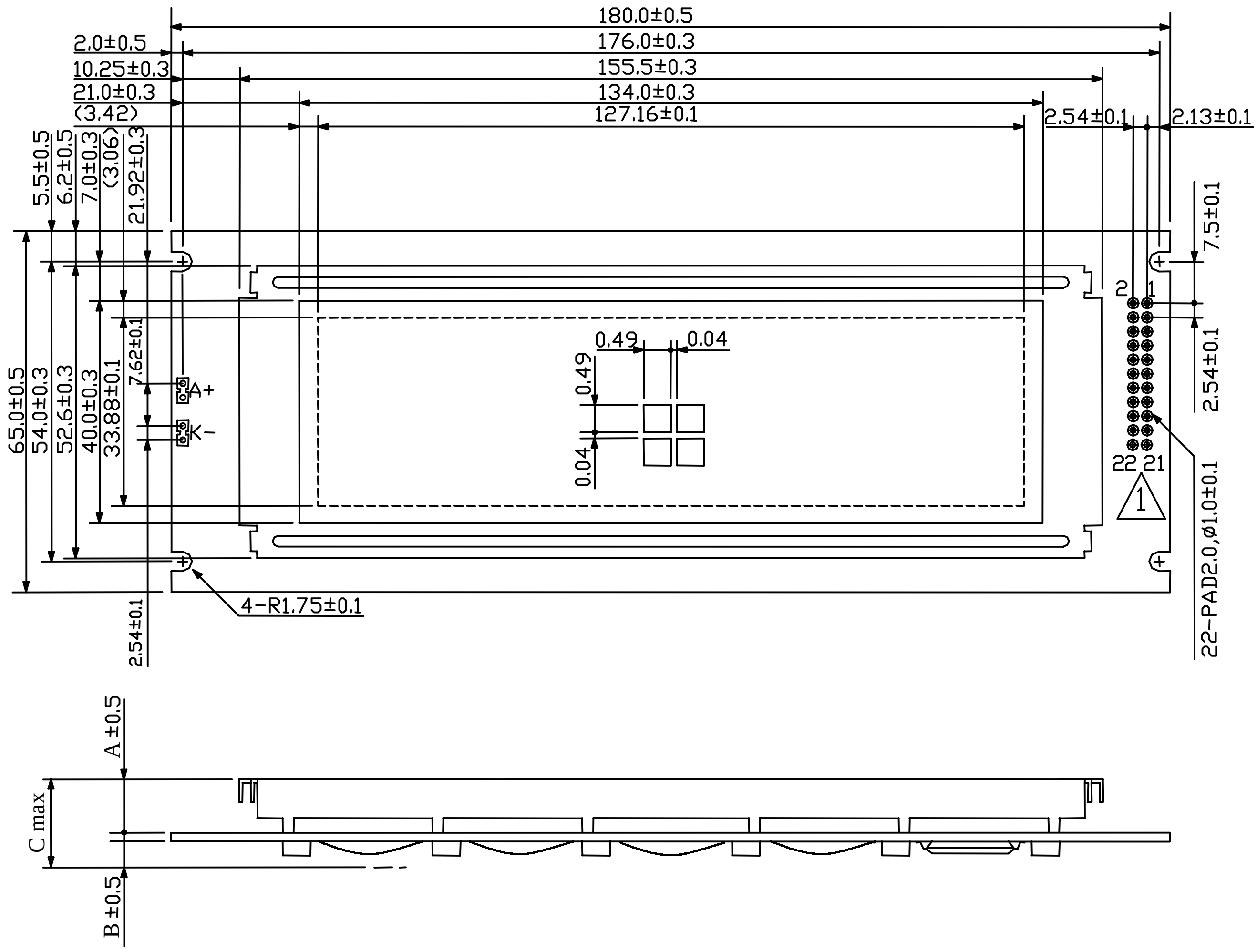
SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	LED TYPE	NOTE
B	Φ = 0° θ = 0°	4.0	----	----	cd/m^2	EL BACKLIGHT	NOTE(2) NOTE(3)
		5.0	----	----		YELLOW-GREEN、ORANGE	
		5.0	----	----		WHITE	

NOTE (1): θ = 0° WHEN VIEWING ANGLE AT 6 O'CLOCK
θ = 180° WHEN VIEWING ANGLE AT 12 O'CLOCK

(2): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.

(3): UNDER NORMAL TEMPERATURE AND HUMIDITY IN A DARK ROOM.

8. Outline dimension



NOTE :

1.UNIT : mm

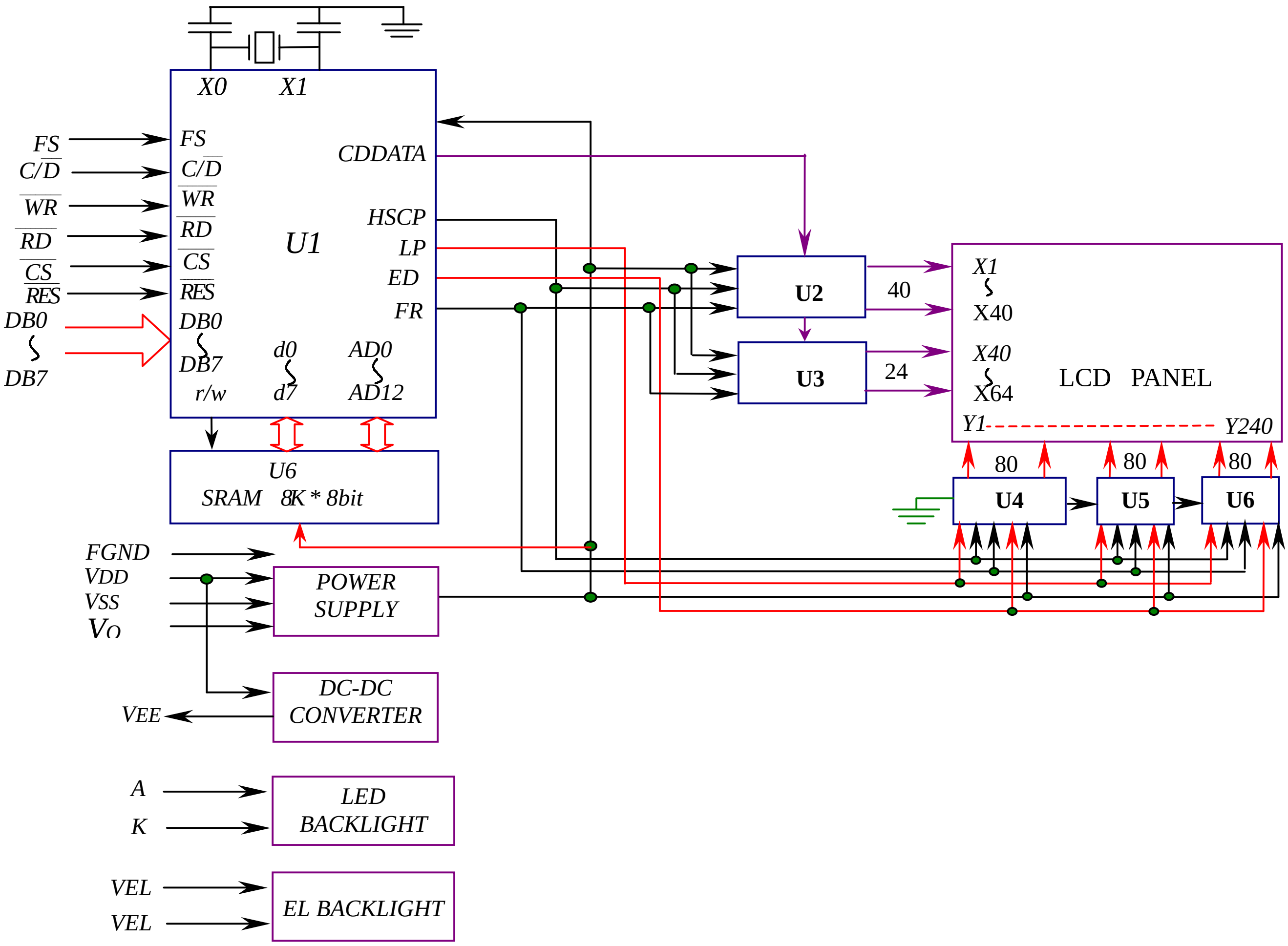
2.SCALE : NTS

THICKNESS	***A***	***B***	***C***	***UNIT***
EL & NO B.L	5.0	1.6	10.0	mm
LED B.L	9.0	1.6	15.0	mm

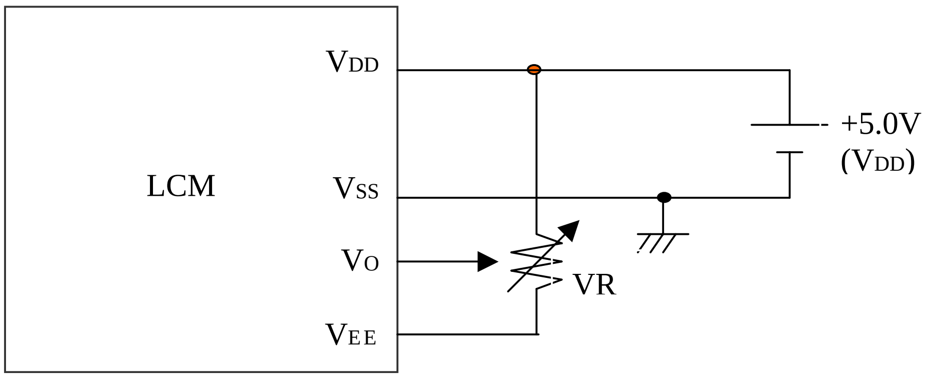
8.1 Interface pin connection

PIN NO.	***SYMBOL***	***FUNCTION***
1	FGND	FRAME GROUND
2	V_{SS}	POWER SUPPLY (GND)
3	V_{DD}	POWER SUPPLY (+5V)
4	V_{O}	OPERATING VOLTAGE FOR LCD DRIVING
5	$\overline{WR}$	L: DATA WRITE (LCD MODULE ← MPU)
6	$\overline{RD}$	L: DATA READ (LCD MODULE → MPU)
7	$\overline{CS}$	L: CHIP ENABLE
8	C/$\overline{D}$	$\overline{WR}$=”L”,C/$\overline{D}$=”H”: COMMAND WRITE C/$\overline{D}$ = ”L”: DATA WRITE $\overline{RD}$=”L”,C / $\overline{D}$=”H” :STATUS READ C/ $\overline{D}$ = ”L” : DATA READ
9	V_{EE}	POWER SUPPLY FOR LCD DRIVING OUTPUT
10	$\overline{RES}$	L: RESET
11	DB0	DATA INPUT/OUTPUT (LSB)
12	DB1	DATA INPUT/OUTPUT
13	DB2	DATA INPUT/OUTPUT
14	DB3	DATA INPUT/OUTPUT
15	DB4	DATA INPUT/OUTPUT
16	DB5	DATA INPUT/OUTPUT
17	DB6	DATA INPUT/OUTPUT
18	DB7	DATA INPUT/OUTPUT (MSB)
19	FS	TERMINALS FOR SELECTION OF COLUMNS H: 6 * 8 FONT L: 8 * 8 FONT
20	N.C	NO CONNECTION
21	N.C	NO CONNECTION
22	N.C	NO CONNECTION
--------	A	POWER SUPPLY FOR LED BACKLIGHT
--------	K	POWER SUPPLY FOR LED BACKLIGHT

9. Block diagram

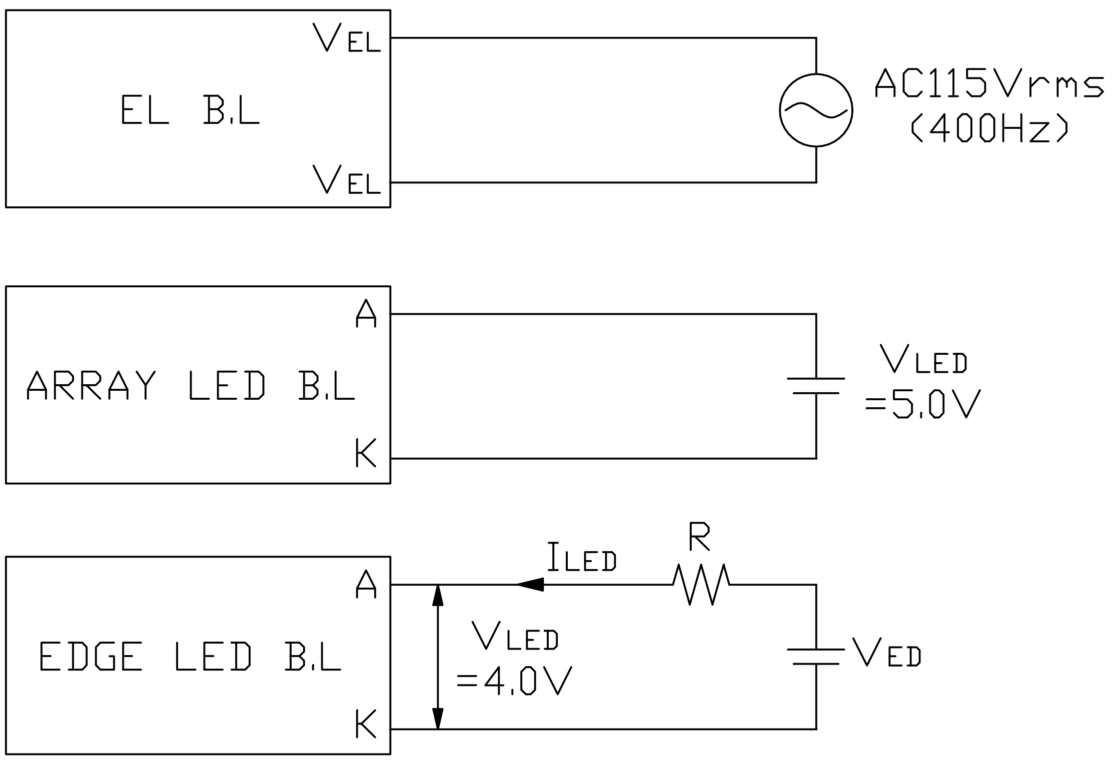


10. Power supply for LCM



VDD–VO: LCD DRIVING VOLTAGE
VR: 200KΩ

10.1 Power supply for backlight



R≧(VED-VLED) / ILED , ILED ≤ 100.0 mA (max)